

# SAFETY

## Green Industries

2010



# **GREEN INDUSTRIES**

## **ACKNOWLEDGEMENTS**

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# GENERAL SAFETY RULES STUDENT CONTRACT

## General Safety Practices for Technological Areas

1. Eye protection must be worn at all times and hearing protection should be worn whenever necessary.
2. Where ventilation is inadequate, wear a dust mask for protection against the dust.
3. Long hair must be tied back.
4. Know the location and use of all safety equipment in technological areas – this includes first aid, protective clothing, eye and ear protection, fire equipment and electrical “stop” buttons.
5. Know the specific safety rules for each of the technological areas.
6. Report all injuries or accidents (no matter how minor they seem) to the teacher immediately. Stay calm.
7. Wear all safety equipment required for a particular operation.
8. Report damaged tools, machine or equipment to the teacher at once.
9. Your clothing and personal appearance must conform to reasonable rules or safety – proper footwear must be worn, loose clothing and jewelry must be avoided.
10. Use particular care when handling long pieces of material. Get help to handle heavy, long or bulky objects.
11. Keep all benches, floors, other work areas and surfaces clean.
12. Rowdy, foolish behaviour is not tolerated. You are expected to act in a mature responsible, safe manner.
13. Portable devices with headphones/ear buds are not allowed.
14. Solvent soaked rags must be hung to dry in a well ventilated area and then disposed of properly in appropriate containers in order to avoid spontaneous combustion.

## Tool Safety

1. Maintain tools in good working condition. Report any concerns to the teacher.
2. Do not use any tool until you have been given proper instruction.
3. Use tools for the designated purpose only.
4. Electric saws operated outside or in wet locations must be protected with a GFCI.
5. Store tools in their proper places.
6. Treat tools, equipment and materials with respect.

## Machine Safety

1. Be certain to receive instruction from the teacher in the correct and safe use of the machine.
2. Report any unsafe or damaged machines to the teacher.
3. Use all guards provided. Make sure that all adjustments have been made correctly before operating the machine. Make all adjustments with the power OFF.
4. Do not under any circumstances use a machine unless there is a qualified teacher present who has given permission for it to be used.
5. Use extreme caution whenever using a power saw – be aware of your cut path and ensure that it is free of electrical wires or other foreign objects.
6. Before leaving any machine, it must come to a complete stop.

In the final analysis, you the student are responsible for complying with all practices intended for your safety and health.

Student Name: \_\_\_\_\_ Student Signature: \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# A SAFE WORK ENVIRONMENT

*A Green Industries classroom needs to be a safe environment for students.*

## A Safe Workplace

Every Green Industries classroom should:

1. Be free of clutter with tools cleaned and stored neatly at the end of each class.
2. Have clearly marked exits.
3. Have a fully stocked first aid kit easily accessible.
4. Have clearly marked emergency equipment such as eye wash stations.
5. Have personal protective equipment available to complete all tasks safely.

## Housekeeping

Keeping the classroom clean is very important, especially if plants are being kept in the classroom environment. Diseases or pest can travel rapidly in an unhygienic environment.

Floors and work surfaces need to be kept clean. All greenhouse tools should be disinfected after each use. Dead leaves and flowers need to be removed. Growing environments need to be regulated and maintained.

## Personal Protective Equipment

Following is a list of the personal protective equipment that is sometimes required by Green Industries activities.

**Safety Footwear:** The most common type of foot injury to occur is from crushing, puncture or laceration. Safety footwear needs to be comfortable and of the proper size. Wearing footwear of an improper size can increase the chance of slips and strains. Footwear needs to be properly laced with no loose or dangling laces. Frayed or damaged laces should be replaced.



Where protective footwear is required it needs to be certified by the Canadian Standards Association (CSA Standard- “Protective Footwear”, CAN/CSA-Z195-M92). An easily identifiable symbol, a green triangle printed with CSA, should be visible somewhere on the footwear.

# A SAFE WORK ENVIRONMENT (Continued)

A steel toe cap should completely cover the toes. If the toe cap cuts into the top of the foot as the footwear bends then a different shoe/boot is required. The sole of the footwear should bend easily when walking. Some soles offer additional protection against shock, insulation against cold or extra grip for slippery surfaces. Beware that no boot will prevent slipping totally.

Safety boots cannot be relied upon to protect your feet in all situations. Very heavy objects can bend the toe cap and cause it to pinch the foot and cause serious injury.

**Eye Protection:** Eyes are very sensitive and are easily damaged. They need to be protected from chemicals, impact, dust and harmful ultraviolet rays. Make sure that eyewear fits properly. Adjust straps or glasses arm length to ensure that glasses won't slip during rigorous activity. The lenses of the eyewear need to be free of scratches or abrasions to allow clear viewing. Eye protection that is damaged in any way should be replaced.



Safety Glasses provide protection from frontal impact injuries only. Safety glasses have heavier impact resistance than regular glasses.

Goggles provide all around protection from impact. Non-ventilated goggles provide protection against chemical splash and vapour as well.

When working outdoors or in unprotected greenhouses you should use eyewear to protect against sun damage. Ultraviolet rays can be very damaging to eyesight with prolonged exposure.

**Hearing Protection:** Noise induced hearing loss is permanent. Many situations could require the use of hearing protection such as the use of power machinery or even striking a chisel with a hammer. The amount of noise related damage is measured by the intensity (loudness) and the duration of the noise. A prolonged noise of less intensity can do as much irreversible damage as a short intense noise. Hearing protection can be greatly reduced if it doesn't fit properly or is removed during a noisy period.



Ear plugs are inserted to block the ear canal. They are sold as a disposable or a reusable product. Be careful not to insert dirty plugs into your ears. Continually taking ear plugs in and out could cause ear infections.



Ear muffs consist of sound-attenuating material fitted into cups with soft cushions supported by a rigid head band. Ear muffs should be adjusted to fit securely to the head.

Electronic devices are not replacements for hearing protection.

# A SAFE WORK ENVIRONMENT (Continued)

**Head Protection:** if there is any construction or if there is any chance for overhead hazards, head protection should be worn. Head protection should be adjusted to fit securely. An adjusting dial or strap should be present at the back of the helmets webbing. After the headwear has been adjusted, bend over to ensure that it doesn't shift or fall off. Replace headwear that has been damaged. If the head protection has sustained a blow it could be compromised without showing any visible damage. Do not remove the webbing from inside.



Different classes of headwear exist. Be sure to consult the occupational health and safety act to ensure that you are using the correct type. The different classes include:

- Class G- General usage (non-conducting)
- Class E- Electrical Trades (non-conducting)
- Class C- Conducting

Head protection needs to be replaced when exposed to the sun for long periods. Sunlight breaks down the plastics used to make the protective shell. Check with the manufacturer for timelines.

**Hand Protection:** Many different types of hand protection are available. Make sure to choose the types that best protects the students hands from the hazards of the activity. Whatever type is chosen needs to fit the hand properly. One size doesn't always fit all.



Heavy leather gloves provide the best protection in most situations. They will resist punctures and abrasions from various sources. Lighter cotton gloves may be less cumbersome but do not offer much protection.

Insulated or lined gloves can be used for work during cold periods.

When dealing with liquids or chemicals (including fertilizers) an unlined rubber or neoprene glove should be used.

**Dust Masks and Respirators:** Any environment with an airborne particulate requires the use of a dust mask. There are many types of masks with varying degrees of protection. In all cases the mask should fit firmly around the nose and mouth. Adjust straps to make sure the mask is fitted firmly to your head.



Be careful that using poorly fitted dust masks with safety glasses can cause the glasses to fog over when the person exhales.

Respirators are required when working with chemicals or pesticides. Respirators require specific cartridge filters depending on the chemical you are using. Consult the manufacturer of the chemical for specifics.



# A SAFE WORK ENVIRONMENT (Continued)

## Preventing Slips and Falls

Surfaces often become wet in the Green Industries classroom. Greenhouse floors, wet and forming algae from a perpetually humid atmosphere are a serious hazard.

1. Be aware of your environment. Take extra caution when floors are wet. Make sure isles are kept clean and free of clutter.
2. Don't run.
3. Take time at the end of a class to clean the floors of any debris. Wash and scrub them with a hard bristle broom to keep algae from forming.

## Chemicals, Pesticides and Fertilizers

Any chemicals kept in the classroom need to be stored in a clearly signed, locked storage area. The storage area needs be ventilated to the outside. Different pesticides and fertilizers should be stored separately. Chemicals should never be stored close to a classroom or greenhouse drain.

Chemicals should only be used by those who have authorization to do so. Protective clothing such as unlined neoprene or rubber gloves should be available to handle chemicals but stored separately.

Any chemical spills need to be cleaned immediately. An absorbent material should be located close by to help clean any spills

Chemicals should always be stored in their original labelled containers.

# HEAVY LIFTING

- Improper lifting techniques can cause back injury. Proper lifting techniques will protect against injury. Never try to lift anything that may be too heavy. Ask for assistance or look for mechanical ways to lift heavy objects that won't risk injury. Never enter contests of strength.
- Safety footwear should be used when lifting anything heavy.
- Before lifting anything ensure that the path you will take when carrying the object is clear of any tripping or slipping hazards.
- Think about how you will pick up an object before attempting lifting it. Size up the weight and size of the object to be lifted. Don't attempt to lift the object if it appears to be too heavy or awkward. Check that there is enough body space and that the ground is level and secure to avoid falling.
- Make certain your balance is good. Keep your feet a shoulder width apart with one foot beside the object and the other slightly behind.
- Bend at the knees, not at the waist. Keep your back straight but not vertical.
- Grip the object with the palms of your hands as well as your fingers. Search for the best possible grip on awkward shaped and unevenly weight distributed objects. Make sure that whatever you are using to grip is securely attached to the object.
- Use your body weight to begin to shift the load and then lift using your leg muscles. Do not use your back to lift heavy objects. Keep your arms and elbows close to your body while lifting and carrying heavy objects. Lifting above your center will shift the weight to a weaker set of muscles and may cause injury.
- When holding a heavy object keep it close to your body in your center. Do not twist at the waist to turn. If you need to turn shift your feet in small steps while keeping the weight centered on your body.
- Reverse the steps of lifting a heavy object when putting it down. Avoid dropping the object as you may be injured if the object falls back toward you or breaks causing flying debris.

# SHOVELS

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Steel toe boots
- Work gloves

## Operating Procedures

- Select a shovel that suits the task and your height. They come in varying lengths and are made for various purposes. Matching the shovel's height to your dimensions limits the strain on your back when you bend forward to shovel.
- Use a pair of gloves and place both hands a comfortable distance apart on the shaft. A firm grip allows for leverage as you begin to shovel.
- Place the shovel's head at a 45-degree angle in the location you plan to dig.
- Use your feet. Wear a sturdy pair of work boots. Place your foot on top of the shovel's head nearest the handle. The shovel needs to rest in your foot's arch or immediately past the heel of your boot.
- Grip the handle tightly and use your weight to press down at a 45-degree angle. Force the shovel's head to disappear beneath the item you are digging. Use your hands to press down toward the ground. Lift the product and move it to where it is being placed.
- Repeat the steps until your shovelling task is complete

## Specific Hazards

- Back, arm and shoulder strain can be a problem. The user should alternate their approach, using both arms and legs as their source of power.
- Shovels can be very sharp. Proper footwear must be worn. Hands and feet should stay out of harm's way.
- Shovels are long. They can easily strike someone who is too close to the working area.
- Be careful when carrying a shovel. The blade should always be in a down position.
- Debris from the shovel can travel a far distance. Observers and coworkers must be careful.
- Never leave shovels lying on the ground.

# SHOVELS (Continued)

A snow shovel often has a very wide, side-less blade that curves upward attached to a long, straight handle. The blade can be metal or plastic. They are effective in lifting and pushing snow



A grain shovel (also 'barn shovel') has a wide aluminum or plastic blade that is attached to a short hardwood handle with "D" top. This shovel has been designed to offer a lighter tool that does not damage the grain. Early models were made from timber.



A spoon shovel or spade is a long bar with a small oval blade at the end, used in excavating deep narrow holes.



A square point shovel is used for edging and detail work.



A square mouth shovel is a general purpose shovel.



A gardening trowel is a small single-hand shovel used in breaking up clumps in soil. Gardening trowels typically have strong, narrow blades with sharp points.



# RAKES

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Steel toe boots
- Work gloves

## Operating Procedures

- Stand comfortably and well balanced.
- With one hand, hold the top end of the handle in a fist grip at the top of the shaft. The second hold is another fist grip lower down the handle.
- Your palms may face up or down depending upon the type of rake and purpose of the action.
- If you are performing a task like leaf raking, both palms will be facing down or towards you with your thumbs securing the other side of the shaft as you reach the rake forward and draw the leaves along the ground towards your feet.
- If you are performing a landscaping task with a heavy duty rake, your palms will face alternately – one up and one down with your thumbs securing the other side of the shaft. You can now manipulate the ground material by pushing it away from you or pulling it toward you as needed.
- Always stand upright when using long-handled gardening tools.

## Specific Hazards

- Stand with the back straight, not stooped. Avoid using the back to push and pull the rake. This is work for arm and leg muscles. A slight bend and flex of the knees helps to take the strain adjust your height and keep the back straight.
- Use a rake that feels comfortable for your height and strength. Wear gloves or use rakes with padded handles to help prevent blisters. Avoid using old rakes that have gotten rusty or that have loose or broken parts.
- Do not let a hat block your vision. Watch out for large rocks, low branches, tree stumps and uneven surfaces.
- Vary your movements, alternating your leg and arm positions often. When picking up leaves, bend at the knees, not the waist.
- Exercise care when walking on wet leaves. They can be very slippery. Avoid falls by wearing shoes or boots with slip-resistant soles.
- Avoid overfilling leaf bags, especially if the leaves are wet. You should be able to carry bags comfortably, so make sure they aren't too heavy or large.
- Do not throw the leaves over your shoulder or to the side. This requires a twisting motion that places undue stress on your back. Back, arm and shoulder strain can be a problem. The user should alternate their approach, using both arms and legs as their source of power.
- These tools can be very sharp. Proper footwear must be worn. Hands and feet should stay out of harm's way.

# RAKES (Continued)

- Long handled tools can easily strike someone else who is too close to the working area.
- Be careful when carrying these tools. The blade should always be in a down position.
- Debris from these tools can travel a far distance. Observers and coworkers must be careful.
- Never leave rakes lying on the ground.

## RAKES

There are light and heavy-duty rakes that are applicable to different situations. Light duty rakes have flexible teeth and are used for moving and collecting grass, leaves, and other loose yard waste. An example of this rake is a Fan Rake.



*Garden, Fan or Leaf Rake*



*Landscaping Rake*

Heavy-duty rakes have strong, sharp teeth. They are used for loosening soil and rocks, levelling the ground, and weeding/removing dead grass. An example of this is a Landscaping Rake

# CULTIVATORS AND HOES

*Cultivators and Hoes are gardener's implements that have a variety of heads on a long or short handle. Their main function is to break up the soil in order to:*

- *allow air to get in (micro-organisms like air)*
- *control weeds, because if the ground is loose, then weeds will not have a solid foundation to root in and will be easier to remove*

*Use of these tools encourage water penetration of the soil. If the soil surface is not smooth or hardened, then water will be absorbed and there won't be as much run-off, meaning more water gets to plant roots.*

## **Personal Protection Equipment (PPE) Requirements**

- Safety glasses
- Work boots
- Work gloves

## **Operating Procedures**

- They are wielded with a controlled downward swinging motion.
- Grip the handle at the end furthest from the blade with one hand.
- With the other hand, grip the handle somewhere around the middle.
- Use the device to slice into the soil around weeds.
- Raise the tool up, so that the blade(s) is out away from your body (either to your left or right side) and approximately just lower than shoulder-height.
- Swing the blade down towards the ground and slightly back towards your body, striking the ground at approximately a 45-degree angle.
- Ideally, you'll penetrate the soil deeply enough to get under the roots and lift out the whole weed, roots and all.
- These tools can now be used to push and manipulate the soft soil into the areas you wish.

## **Specific Hazards**

- Back, arm and shoulder strain can be a problem. The user should alternate their approach, using both arms and legs as their source of power.
- These tools can be very sharp. Proper footwear must be worn. Hands and feet should stay out of harm's way.
- Long handled tools can easily strike someone else who is too close to the working area.
- Be careful when carrying these tools. The blade should always be in a down position.
- Debris from these tools can travel a far distance. Observers and co-workers must be careful.
- Never leave cultivators and hoes lying on the ground.

## CULTIVATORS AND HOES (Continued)

Garden hoes and cultivators are essentially poles to which a specific head has been fastened, at a 90-degree angle. The poles (handles) are about 4.5 feet long or around 1 foot long.



*Long Handled Cultivator*



*Short Handled Cultivator*



*Hoe*



*Stirrup or Hula Hoe*



# HAMMERS

*Hammers are striking tools designed to drive and remove nails and other fasteners. In the case of sledgehammers, they can be used to manipulate large framing members into place, or to assist in demolition.*

## Personal Protection Equipment (PPE) Requirements

- Safety glasses

## Operating Procedure

### Driving Fasteners Safely

- To hammer in a nail, hold it in one hand between thumb and forefinger towards the point.
- Securely hold the shaft of the hammer lightly tap the head of the nail to set it straight slightly imbedding it into the material.
- Be aware of your surroundings – take a look around before you begin swinging.
- In order to avoid accidentally hitting someone or something.
- Watch the head of the nail, not the hammer.
- Keeping your hand and wrist rigid and secure, take smooth, controlled strokes, driving the nail into the material.
- When nailing together pieces of very hard wood, such as oak or maple, or driving large fasteners into large landscaping timbers with a sledgehammer, drilling a pilot hole in the material can make it easier to drive the fastener into the wood.

### Removing Fasteners Safely

- Force the claw of the hammer under the head of the nail and pull on the handle so that the claw comes up pulling at the fastener.
- When the nail is partway out it may help to slip a piece of scrap wood under the hammer head in order to improve leverage before continuing to draw the nail out This helps protect the material from scarring as well.

## Specific Hazards

A hammer is one of the most common tools around. However simple it is to use, certain safety precautions should always be taken when using this striking tool.

- Wear safety glasses. They'll protect your eyes from any flying projectiles. The purpose of most hammers is to drive and remove nails. Using it for any other purpose could ultimately result in an injury.
- Only use the hammer's head to strike an object, never the side, or handle. Improper use is the leading cause for a hammer breaking.
- Never use a hammer that has a damaged or cracked handle or chipped head.
- Be particularly careful of striking parts of your body by accident.
- Be aware of repetitive strain injuries and take necessary actions.

# HAMMERS (Continued)

Carpenter's or Framing Hammer – general purpose hammer mostly used for hammering nails into wood and removing them.



Sledgehammer – used in construction and landscaping



Mallets - Wooden mallets are typically used in woodworking to hit two pieces of wood together or to drive dowels or chisels



# PRY BARS

*Also known as crowbars, pry bars are metal bars with a curved end with flat points. It is used as a lever to force apart two objects or it can be used to pull out large nails.*

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Work gloves
- Work boots
- Dust mask



## Operating Procedures

- The crowbar is used to lever attached items apart and is mostly used for demolition purposes.
- Secure the object you are demolishing. Trying to pry apart something that isn't properly secured can result in you just moving the object without the object being pried apart.
- Check to see if there are any breakables or nails attached before you lever an object apart.
- Always pry with the bar away from yourself.
- Make sure the area is clear.
- Find a narrow crack and insert the pry bar into the crack and then apply force slowly. Never quickly break something apart, especially if you have no idea what is behind or inside.  
Apply force by bending the knee away from the object, crouching and pushing down or away from you with your arms slowly. Do not twist or bend your back. You can injure yourself by bending or twisting your back while applying force, especially if the object gives way suddenly.
- If the object you are levering apart is vertical then apply force with your arms and shoulders, not your back.
- Be aware of the weight and structure of your crowbar. A crowbar can only pry apart so much weight. If the crowbar is bending, stop.

## Specific Hazards

- Always wear the correct PPE or personal protection equipment when using a crowbar.
- Never apply force quickly to an object you are prying apart.
- Be aware of yourself and other people in the area to prevent injury.
- Be aware of muscle strains.
- Pry bars are sharp and heavy. They can cause cuts and bruising. Wear work gloves and work boots.
- Pry bars will cause debris to become airborne. Wear safety glasses and a dust mask.

# TROWELS

A handy hand tool used for levelling, spreading or shaping substance. It is a flat-bladed hand tool, used specially in construction and gardening that comes in various shapes and sizes. It consists of a metal flat blade attached to a short handle. Trowels are variously used to spread, scoop, dig, and place. Trowels are referred to as hand spades or miniature shovels.

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Work gloves



Garden Trowel

## Operating Procedures

Trowels can be used to dig and manipulate soil or they can be used to spread and smooth a material like cement or mortar.

- Choose the appropriate trowel for the job.
- Ensure that the tool is in good condition.
- Grasp the handle firmly.
- For digging or scooping a material, enter the point of the trowel into the material and lift slowly as you pull the angle of the handle closer to the ground.
- Be sure not to lift too quickly causing the material to be tossed into the air.
- For spreading and smoothing, use a flat trowel to pick up the desired material. The material is now on top of the trowel blade balanced and ready for transport.
- Move the trowel with the material to the desired area.
- Carefully lay out the material in a controlled fashion as you need.
- Use the bottom of the flat trowel to spread, manipulate and smooth out the material into the desired effect.



Masonry Trowel

## Specific Hazards

- Trowels can be sharp. Keep hands out of harm's way.
- Be aware of your surroundings.
- Material can be propelled into the air. Wear safety glasses to protect eyes.

# PRUNERS

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Work gloves

## Operating Procedures

- Wear safety glasses when using cutting tools.
- Use the appropriate cutting tool to match the size of the task.
- Secateurs (pruners) are used for more intricate pruning jobs and are often used with one hand to trim thin and softer stems of small plants and shrubs. They are also used to take cuttings off plants. Secateurs are used more for trimming smaller branches on plants while shears are more commonly associated with trimming hedges.
- Use hedge shears to shape and lightly trim hedges. Select hedge shears that are lightweight and have serrated blades, that will cut through heavy material. When selecting a hedge shear, make sure it has the rubber shock absorber between the blades.
- Use long reach pruners for cutting heavier wood. They have a bypass cutting head so that you can make pruning cuts close to the trunk or stem.
- The longer handles make it easier to work on hedges or tall shrubs.
- A good balance and proper positioning is required. These tools are all very sharp and have powerful lever systems.
- Keep fingers away from the blades and pinch points at all times.
- When using shears or secateurs always wear sturdy thick gardening gloves.
- Lock the safety catch and properly store the tool in a safe location.

## Specific Hazards

- Cuts from thorns and prickly plants, sharp blades
- Back strain from cutting and reaching overhead

# PRUNERS (Continued)

## Pruners

Pruners, also known as secateurs, are specialized scissors used on plants. They are used to remove excess/dead leaves, cut off segments of plants, and harvest fruits from plants without damaging the plant stalk.



## Long reach pruners

These tools help you prune plants that are out of normal reach. Some of the long reach pruners can be used to help with standard pruning jobs. They have great cutting strength due to their improved leverage.



## Shears

Shears come in different varieties. There are short handled shears that are used to clip hedges or for cutting through long grass. Topiary enthusiasts create their marvellous hedge 'artwork' with them. Longer handled garden shears are more commonly used to trim lawns more closely after a cut and to trim and shape borders around the garden.



## Floristry Scissors

Scissors used by florists to cut flower stems and floristry wire when arranging flowers. A variety of sizes and styles are available.



# POLE PRUNERS

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Hearing protection (e.g., ear plugs)
- C.S.A. Approved safety footwear
- Head protection
- Face shield (optional)
- Hand protection

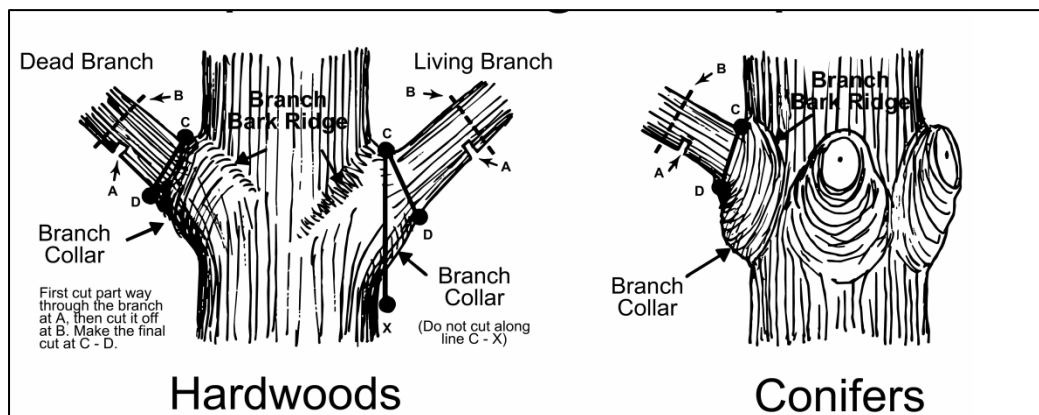
## Set-up

- Keep adults, children and pets away from the work area. Use caution tape or pylons to indicate your work area so that bystanders do not wander into it.
- Carry the pole pruner unextended with the blade in front of you.
- Choose an uphill position that is not underneath the branch being cut.
- Keep a path of retreat clear in case the cut branch falls in an unplanned way or bounces once it hits the ground.



## Operating Procedures

- Only prune while sufficient light is available.
- Keep both feet on the ground. Do not work from an off-the-ground position.
- Position the saw blade on top of the branch outside of the branch bark ridge and apply downward pressure as you pull back and forth using a sawing motion. Larger branches should be removed in sections. Where there is potential for the bark ripping off of the trunk use a 3 point cut method to reduce the damage to the tree.
  - Under cut  $\frac{1}{4}$  limb diameter near tree trunk
  - Finish top cut slightly further out on limb
  - Cut off stump near to trunk outside of collar and bark ridge.
- Pull the saw free of the tree without causing damage to other limbs or trunk.



# POLE PRUNER (Continued)

## Specific Hazards

- Never use a pole pruner by yourself. Make sure that someone is close by to help if an injury occurs.
- Do not attempt to prune a tree that is near utility lines. Severe injury or death could result.
- Do not attempt to prune limbs or branches beyond the height of the pole pruner.



# WHEELBARROW

*The Wheelbarrow is an integral tool for gardeners and landscapers. It consists of a tray (a cavity usually made of either steel or plastic) supported by handles with one or two wheels in the front. Many variations exist but they all follow the same principle.*

*A wheelbarrow with two wheels in the front provides greater stability on level ground. A wheelbarrow with a single wheel in the front provides better maneuverability in close spaces and flexibility over sloped surfaces. The choice of wheelbarrow depends on how it is intended to be used. A plastic tray will only allow for light garden work. A steel tray can be loaded with heavier materials.*

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Approved safety footwear

## Operating Procedures

- Inspect the wheelbarrow for loose hardware or damaged components.
- Check the handles for splits or cracks that could cause them to break during transport.
- Make sure that the tire(s) are inflated properly before loading material into the wheelbarrow. Some wheels are solid rubber and do not require inflating.
- Always load a wheelbarrow with it facing the direction you plan on taking it. Ensure that the path you plan on using is free of clutter and stable.
- When loading a wheelbarrow on a slope face it either up or down the slope. Loading it sideways on a slope could either cause it to topple its contents or cause unnecessary back strain when you try to lift an uneven weight.
- If a wheel barrow begins to tip, quickly step out of the way and allow the load to fall. Trying to prevent it from falling can cause serious injury as the weight of the wheelbarrow carries you with it or pulls the back muscles suddenly and unevenly.
- When walking with a wheelbarrow keep your arms straight and close to your side. Bending your arms at the elbow can strain your back and tips the wheelbarrow forward increasing the chance that the front will catch the ground. This may cause injury and spilling of its contents. The wheelbarrow can be turned by shifting the back end by its handles.
- When you have your destination with the full wheelbarrow the contents are emptied by quickly raising the handles, allowing the front to catch the ground and preventing it from moving forward. The contents of the wheelbarrow will empty out in front.
- Never try to move more weight than you can capably manage.
- Wheelbarrows are easier to move on stable hard surfaces than on uneven soft surfaces.



# LINE TRIMMER

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Long pants
- Hearing protection (e.g., ear plugs)
- C.S.A. Approved safety footwear

## Set-up

- Do not remove shields, guards, safety devices or decals. If any of these have been damaged then repair or replace them before continuing to operate the machine.
- Clear the area where you are working. Remove any rocks, branches, string or wire that may become entangled in either the blade or cutting line.
- Never run the engine indoors without proper ventilation of fumes.
- Keep adults, children and pets away from the area to be trimmed.
- If the unit is equipped with a shoulder harness then always wear the harness, adjusting it to a comfortable position.
- Most trimmers are intended to be used from the right side of the operator's body.
- Using the trimmer on the left side may expose the operator to hot surfaces.



## Operating Procedures

- Wear personal protection equipment.
- Only operate the machine while sufficient light is available.
- Keep all parts of your body away from any moving parts.
- Read the operators manual before starting the machine. Do not allow anyone to operate the machine without having been previously approved to do so.
- If the trimmer has an on/off ignition switch then make sure the engine is in the on position.
- If the engine is cold move the choke lever to full or on.
- Grasp recoil grip with one hand while holding safety shut off with the other hand. Ensure stable footing. Pull the cord forcefully to overcome engine compression. Repeat the process until the engine has started.
- Once the engine has started move the choke back to half or off as the engine warms up.
- Squeezing the throttle trigger will engage the cutting head. Make sure that nothing is near the cutting head when it engages.
- Sweep the cutting head a consistent height above the ground in front of you. Do not attempt to cut woody plant material or weeds with a stem diameter greater than a ¼".
- If the line becomes too small to use, extend it out from the head in whatever manner the manual indicates until is of a usable length.
- Do not use the trimmer to cut anything above 30 inches from the ground.
- To stop the trimmer move the ignition switch to the off position.

# LINE TRIMMER (Continued)

## Specific Hazards

- To avoid burns, never touch the engine or exhaust while the machine is running or until it has a chance to fully cool down after operation.
- Fuel related hazards:
  - Gasoline is highly flammable.
  - Always use approved containers for gasoline.
  - Do not refuel engine while it is hot. This could cause a fire.
  - Do not overfill the engines gas reservoir.
  - If the spout does not fit inside the fuel tank then use a funnel.
  - Do not refuel the machine overtop of surfaces that may be permanently damaged by overflow of gasoline.
  - Clean any spilled gasoline immediately.
  - Most line trimmers require a gas/oil mix consult the manual to ensure that you are using the correct fuel.
  - Be sure to mark containers that have mixed contents.

# LEAF BLOWER

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Long pants
- Hearing protection (e.g., ear plugs)
- C.S.A. Approved safety footwear



## Set-up

- Do not remove shields, guards, safety devices or decals. If any of these have been damaged then repair or replace them before continuing to operate the machine.
- Never run the engine indoors without proper ventilation of the fumes.
- Keep adults, children and pets away from the area to be trimmed. If approached stop using the machine immediately.
- Be sure that back straps are adjusted to fit properly on the operator's back. Be sure that all latches can be secured correctly.

## Operating Procedures

- Wear safety glasses.
- Only operate the machine while sufficient light is available.
- Keep all parts of your body away from any moving parts.
- Do not operate the blower in awkward positions. Keep your feet balanced and secure at all times.
- Read the operators manual before starting the machine. Do not allow anyone to operate the machine without having been previously approved to do so.
- If the blower has an on/off ignition switch, make sure the engine is in the on position.
- The blower may require priming. If the blower has a fuel primer bulb, press the primer the indicated amount of times (usually 5-10 times).
- If the engine is cold move the choke lever to full or on.
- Press and hold the throttle safety lock and squeeze the throttle to the start position.
- Grasp the recoil grip with one hand while holding the safety shut off with the other hand. Ensure stable footing. Pull the cord forcefully to overcome engine compression. Repeat the process until the engine has started.
- Once the engine has started move the choke back to half or off as the engine warms up.
- Do not blow debris in the direction of bystanders.
- To clear an area of light debris, pick a logical starting point, such as the back corner of a property and point the blower nozzle at the debris to be moved. Use a back and forth sweeping motion to force the debris toward a desired location for clean up. Wind direction may influence your ability to move debris in the manner you have decided.
- To stop the blower, allow the engine to drop to an idle and move the ignition switch to the off position. Never stop an engine at full throttle.

- Do not allow the blower to run continuously for long periods of time. Allow the blower to cool down at idle speed 15 minutes for every 30 minutes running.

## LEAF BLOWER (Continued)

### Specific Hazards

- To avoid burns, never touch the engine or exhaust while the machine is running or until it has a chance to fully cool down after operation.
- Fuel related hazards:
  - Gasoline is highly flammable.
  - Always use approved containers for gasoline.
  - Do not refuel engine while it is hot. This could cause a fire.
  - Do not overfill the engines gas reservoir.
  - If the spout does not fit inside the fuel tank then use a funnel.
  - Do not refuel the machine overtop of surfaces that may be permanently damaged by overflow of gasoline.
  - Clean any spilled gasoline immediately.
  - Most leaf blowers require a gas/oil mix consult the manual to ensure that you are using the correct fuel.
  - Be sure to mark containers that have mixed contents.
- The blower's excessive vibration can cause tingling or numbness in the fingers. If you feel any discomfort, redness, or swelling in your fingers discontinue using the machine

# JACK HAMMER

## Personal Protection Equipment (PPE) Requirements

- Eye protection
- Long pants
- Hearing protection (e.g., ear plugs)
- C.S.A. Approved safety footwear
- Dust mask (in applications that create dust)



## Set-Up

- Read the operators manual before using the Jack Hammer. Do not allow anyone to operate the machine without having been previously approved to do so.
- Ensure that the switch is in the off position before plugging the jack hammer into an electrical outlet.
- Make sure the area where you are working has stable footing and that it is clear of debris. Keep all electrical cords tidy and outside of work area traffic.
- Locate all utilities in the area of work. Breaking into gas or electrical wiring could cause serious injury.
- Insert the required tool end (steel) into the jack hammer by rotating the tool retaining lever to the open position and insert the tool the tool. Bring the tool retaining lever back down so that it holds the tool below the collar.

## Operating Procedures

- To turn the jack hammer on depress the switch to the number “1” position. To turn it off depress the switch back to the number “0” position.
- The jack hammer may require a warm up period depending on how cold the work environment is before it performs properly. Do not allow the machine to operate without load. This can damage the jack hammer.
- Maintain a consistent, moderate pressure on the tool for best results. The tool should be held at an angle between 80 and 60 degrees. Use the jack hammer to break off small quantities of material at a time. Trying to break too much decreases the efficiency of the tool and increases the likelihood that the steel may become embedded in the work surface.
- Do not allow the steel to become embedded in the working surface. If the steel becomes lodged in the work surface, it may be required to detach the steel from the jack hammer, insert a new steel, and dislodge the original by breaking the material around it. Avoid using a hammer to try dislodging an embedded steel.
- Jack hammers are very top heavy and can fall easily if left leaning against a wall or object. Secure the jack hammer when it is not in use by laying it down in an area that is safe and outside of work traffic.

# JACK HAMMER (Continued)

## Specific Hazards

- Make sure the work area is kept clean. Debris can cause tripping hazards.
- Do not allow small pieces of debris to be thrown into waste containers or wheelbarrows. This could cause serious injury from the missile itself or by fragments breaking off.
- Re-establish footing as the material is being broken to keep from becoming unbalanced.

# WALK BEHIND ROTARY MOWER

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Long pants
- Hearing protection (e.g., ear plugs)
- C.S.A. Approved safety footwear



## Set-up

- Read the operators manual before starting the machine. Do not allow anyone to operate the machine without having been previously approved to do so.
- Keep feet and hands clear of the cutting deck when starting the engine.
- Do not remove shields, guards, safety devices or decals. If any of these have been damaged then repair or replace them before continuing to operate the machine.
- Never run the engine indoors without proper ventilation of fumes.
- To avoid burns, never touch the engine or exhaust while the machine is running or until it has a chance to fully cool down after operation.
- Keep adults, children and pets away from the area to be mowed.
- Remove foreign objects and debris from the area to be mowed.
- Keep mowing deck clean prior to operation of the machine. Make sure engine is off and blades have stopped rotating before cleaning or removing objects from under the mowing deck.
- Blades need to be sharpened periodically to ensure proper performance.
- Set mower to cut at the correct height.

## Operating Procedures

- Start up procedures may differ for individual mowers. Always consult the manual to find specific instructions for your mower.
- If the mower has an ignition switch then make sure it is in the on position.
- Make sure fuel shut off valve is in the on/open position.
- Some engines require you to prime the engine with fuel. If your mower has a fuel primer bulb then press it the indicated amount of times.
- If the engine is cold then make sure choke is set to full position. As the engine warms up the choke may be set to off. Set engine throttle to start or run position.
- Grasp the recoil grip with one hand while holding the safety shut off with the other hand. Ensure stable footing. Pull the cord forcefully to overcome engine compression. Repeat the process until the engine has started.



- Always operate the mower by walking behind it. Never run behind the machine. Never pull the machine toward you or operating from the side.
- Ensure proper footing on slopes. Mow across the slope, not up or down. Never operate the machine when grass is slippery. Do not use the mower on excessive slopes.
- When finished mowing, turn engine off by turning the switch to the off position or by releasing the engine kill safety lever.

## WALK BEHIND ROTARY MOWER (Continued)

### Specific Hazards

- Before performing any repairs or maintenance, remove sparkplug to prevent accidental starting of the machine.
- Fuel related hazards:
  - Gasoline is highly flammable.
  - Always use approved containers for gasoline.
  - Do not refuel engine while it is hot. This could cause a fire.
  - Do not overfill the engines gas reservoir.
  - If the spout does not fit inside the fuel tank then use a funnel.
  - Do not refuel the machine overtop of surfaces that may be permanently damaged by overflow of gasoline.
  - Clean any spilled gasoline immediately.

# AERATOR

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Long pants
- Hearing protection (e.g., ear plugs)
- C.S.A. Approved safety footwear

## Set-up

- Read the operators manual before starting the machine. Do not allow anyone to operate the machine without having been previously approved to do so.
- Do not remove shields, guards, safety devices or decals. If any of these have been damaged then repair or replace them before continuing to operate the machine.
- Locate all utilities. Do not aerate in an area that has underground utilities that may be damaged. Locate any irrigation lines or sprinkler heads that may be damaged by the aerator and mark them with inverted spray paint or flags.
- Do not operate the aerator in an area that may have large underground rocks that may damage the machine.
- Remove foreign objects and debris from the area to be aerated.
- Check oil level in engine crankcase.
- Inspect air filters and clean if necessary.
- Never run the engine indoors without proper ventilation of fumes.
- Keep adults, children and pets away from the area to be aerated.



## Operating Procedures

- Do not operate the machine when it is dark or hard to see clearly.
- Start up procedures may differ for individual aerators. Always consult the manual to find specific instructions for your aerator.
- Never start the aerator with the transmission for the tines engaged. Make sure that the transmission is in neutral.
- Keep hands, feet, and any loose clothing away from rotating parts of the machine.
- If the aerator has an ignition switch then make sure it is in the on position.
- Make sure fuel shut off valve is in the on/open position.
- If the engine is cold then make sure Choke is set to full position. As the engine warms up choke may be set to off. Set engine throttle to start or run position.
- Grasp recoil grip with one hand while holding safety shut off with the other hand. Ensure stable footing. Pull the cord forcefully to overcome engine compression. Repeat the process until the engine has started.

# AERATOR (Continued)

- Engage the tines to begin aerator. Practice operating the machine in an open area prior to operation in tight areas. **Caution:** if the soil is compacted or if the tines are not able to break the surface the aerator may suddenly lurch forward. The soil may need to be softened first by lightly watering the area.
- Ensure proper footing on slopes. Operate the aerator across the slope, not up or down. Never operate the machine when the lawn is slippery. Do not use the aerator on excessive slopes.
- When finished aerating, turn engine off by turning the switch to the off position or by releasing the engine kill safety lever.

## Specific Hazards

- To avoid burns, never touch the engine or exhaust while the machine is running or until it has a chance to fully cool down after operation.
- Before performing any repairs or maintenance, remove sparkplug wire to prevent accidental starting of the machine.
- Related to Fuel:
  - Gasoline is highly flammable.
  - Always use approved containers for gasoline.
  - Do not refuel engine while it is hot. This could cause a fire.
  - Do not overfill the engines gas reservoir.
  - If the spout does not fit inside the fuel tank then use a funnel.
  - Do not refuel the machine overtop of surfaces that may be permanently damaged by overflow of gasoline.
  - Clean any spilled gasoline immediately.

# DETHATCHER

## Personal Protection Equipment (PPE) Requirements

- Safety glasses
- Long pants
- Hearing protection (e.g., ear plugs)
- C.S.A. Approved safety footwear

## Set-up

- Read the operators manual before starting the machine. Do not allow anyone to operate the machine without having been previously approved to do so.
- Keep feet and hands clear of the deck when starting the engine.
- Do not remove shields, guards, safety devices or decals. If any of these have been damaged then repair or replace them before continuing to operate the machine.
- Never run the engine indoors without proper ventilation of fumes.
- To avoid burns, never touch the engine or exhaust while the machine is running or until it has a chance to fully cool down after operation.
- Keep adults, children and pets away from the area to be dethatched.
- Remove foreign objects and debris from the area to be dethatched.
- Clean the dethatcher of any debris prior to operation. Clear the belt and cooling fins to reduce the risk of fire.
- Make sure the machine is in the transport position before starting the engine.
- Move the machine in the transport position to the area that needs dethatching.



## Operating Procedures

- Do not operate the machine when it is dark or hard to see clearly.
- Start up procedures may differ for individual mowers. Always consult the manual to find specific instructions for your dethatcher.
- If the dethatcher has an ignition switch then make sure it is in the on position.
- Make sure fuel shut off valve is in the on/open position.
- If the engine is cold then make sure Choke is set to full position. As the engine warms up choke may be set to off. Set engine throttle to start or run position.
- Grasp recoil grip with one hand while holding safety shut off with the other hand. Ensure stable footing. Pull the cord forcefully to overcome engine compression. Repeat the process until the engine has started.
- Always operate the dethatcher by walking behind it. Never pull the machine toward you or operate from the side.
- Ensure proper footing on slopes. Work across the slope, not up or down. Never operate the machine when grass is slippery. Do not use the dethatcher on excessive slopes.
- When finished dethatching, turn engine off by turning the switch to the off position or by releasing the engine kill safety lever.

# DETHATCHER (Continued)

## Specific Hazards

- Before performing any repairs or maintenance, remove sparkplug to prevent accidental starting of the machine.
- Related to Fuel:
  - Gasoline is highly flammable.
  - Always use approved containers for gasoline.
  - Do not refuel engine while it is hot. This could cause a fire.
  - Do not overfill the engines gas reservoir.
  - If the spout does not fit inside the fuel tank then use a funnel.
  - Do not refuel the machine ovetop of surfaces that may be permanently damaged by overflow of gasoline.
  - Clean any spilled gasoline immediately.

# CHOP SAW

*A chop saw is a lightweight circular saw mounted on a spring-loaded pivoting arm, and supported by a metal base. Chop saws are considered the best saw to get very exact, square cuts. These are ideal saws for cross-cutting lumber.*



## Personal Protection Equipment (PPE) Requirements

- Safety glasses are required
- Hearing protection
- Dust mask
- A full face shield is recommended

## Set-up

- Read and understand the operators manual before using this machine.
- Ensure that the workspace is clean and clear.
- Use appropriate PPE (glasses, hearing protection, dust mask).
- Remove jewellery, secure loose clothing and tie back long hair.
- Check that the dust collector bag is not full - empty when necessary.
- All guards must be in place and operating. If a guard seems slow to return to its normal position or hangs up, adjust it or repair it immediately.
- Unplug or lockout power when making repairs.
- Ensure that appropriate rollers or support devices for longer stock are in place before operation.
- Always inspect lumber for foreign objects such as hardware and loose knots.
- Hands and fingers must be kept clear of the path in which the blade travels.
- Clean the lower guard frequently to help visibility and movement. Unplug before adjusting or cleaning.
- Use only the recommended RPM and sizes of blades.
- Regularly check and tighten the blade and the blade-attachment mechanism.
- Prior to installing or changing a blade, be sure to lockout or unplug equipment. Install the blade for the material and procedures being completed.
- Maintain and use sharp blades to avoid burning and using excessive force.
- Ensure that the blade and its related washers and fasteners are correctly positioned and secured on the saw's arbour.
- To avoid losing control or placing hands in the blade path, hold or clamp all material securely against the fence when cutting. Do not perform operations freehand.
- Extra care should be taken with small pieces. Hands should always be a minimum of 6" away from blade.
- Lengths of wood below 12" may need to be cut with an auxiliary fence or clamping system.
- Long material should be supported at the same height as the saw table.
- Never place hands or fingers in the path of the blade or reach in back of the fence.

# CHOP SAW (Continued)

- Use the brake to avoid contact with a coasting blade. Do not reach into the cutting area until the blade comes to a full stop.
- After completing a cut, release the trigger switch and allow the blade to come to a complete stop, then raise the blade from the cutting material. If the blade stays in the cutting area after the cutting is complete, injury can result from accidental contact

## Operating Procedures

- The chop saw is operated by the operator lining up the saw blade with the user's mark on the material.
- The operator should be positioned to the left of the blade assembly.
- The operator then positions the hands properly. The left hand secures the material tight with an edge against the fence. Keep fingers 6"-8" away from blade.
- Do not attempt to cut without the use of the fence.
- The right hand works the operating control handle. The trigger is depressed to activate the blade and in a short, controlled motion, bring the saw blade downwards onto the wood.
- The blade is pulled through the work piece. The left hand secures the material and the right hand stays firmly on the handle.
- Once the blade has been guided through the cut, the user guides the saw back to the upright position.  
The angle of the blade is adjustable in relation to the fence to an accuracy of 1 degree.
- The self-retracting blade guard will retract when the blade is being lowered.
- Materials to be cut should never be stacked.
- Cuts are cross-cuts, not rip cuts.
- The right hand maintains the position on the handle. The operator should never cross arms or hands through the cutting path of the blade.
- Never shift the material during the cutting operation. The material must remain stable.
- Only start the saw when the blade is in the upright position above the materials with the guard covering the blade.
- Always control the movement of the blade with a consistent motion at a moderate pace.
- When the cut is complete, immediately return the motor housing and blade to the upright position.
- Turn the machine off ensuring that the blade has stopped moving and that the guard has returned to its safety position and is completely covering the blade.
- Remove any waste and leave workspace clean for the next use.

## Specific Hazards

- Gloves, loose clothing, jewellery, or any dangling objects including long hair should not be worn as they may catch in the rotating parts of the saw.
- Avoid potential contact with the turning blade. Ensure that all guards are in place and working. If a guard seems slow to return to its normal position, adjust or repair it immediately. Use only recommended size and RPM rated blades.
- Maintain sharp blades.
- Always wear eye and face protection.

# TABLE SAW

*A table saw is a motorized circular saw blade mounted on an arbor below the surface level of a large table. About half of the blade protrudes out of the table. Pieces are held against the guide fence or a mitre gauge and pushed smoothly past the blade. Table saws are used for straight sawing. Table saws can cut either across (crosscut) or with (ripsaw) the grain of the wood.*

## **Personal Protection Equipment (PPE) Requirements**

- Safety glasses are required
- Hearing protection
- Dust mask

## **Set-up**

- Read and understand the operators manual before using this machine.
- Ensure that the workspace is clean and clear.
- Use appropriate PPE (glasses, hearing protection, dust mask).
- Check that the dust collector bag is not full - empty when necessary.
- Remove jewellery, secure loose clothing and tie back long hair.
- Do not wear gloves while operating a table saw.
- Wear non-slip footwear.
- Position your body so that it is NOT in line with the blade. This is to avoid being injured by flying sawdust, woodchips or the work.
- The height of the blade should be set just slightly higher than the stock being cut. It should be 6mm - 13mm above the height of the stock.
- All guards must be in place and operating. If a guard seems slow to return to its normal position or hangs up, adjust it or repair it immediately.
- Unplug or lockout power when making repairs.
- Ensure that appropriate rollers or support devices for longer stock are in place before operation.
- Long material should be supported at the same height as the saw table.
- Always stand firmly and well balanced on the floor and avoid any awkward operations or positions.
- Use a push stick to cut stock that is 6" (150mm) or less in width.
- Use only the recommended RPM and sizes of blades.
- Make sure that the appropriate blade is being used for the material and procedures being completed
- Regularly check and tighten the blade and the blade-attachment mechanism.
- Maintain and use sharp blades to avoid burning and using excessive force.
- Always disconnect the power prior to changing the blade or performing any other maintenance operation.
- Make sure that the blade has stopped turning before you adjust the table saw.
- After any adjustment, make sure that the blade is free before you turn on the power.



## TABLE SAW (Continued)

- Ensure that the guides are positioned properly and that the tabletop is smooth and polished. An unclean or rough table requires you to use more force to push the stock through the blade. The more force that you are required to use the more chance that you may slip or lose your balance.
- Lock the fence in position before starting the cutting operation.
- Make sure that others are not in harms way should a kickback occur.
- Ensure that anyone assisting with supporting the stock on the out-feed knows the safe operating procedures (they are to support material only).
- Maintain the rip fence parallel to the blade so the stock will not bind on the blade and be thrown back.
- Check the throat plate to ensure that it fits exactly and has a slot just slightly larger than the blade. Never operate a table saw with the throat plate removed
- Do not make free-hand cuts on the table saw. The stock must be guided through the blade either by the rip fence or the mitre gauge.
- Keep the blades' guards, spreaders and anti-kickback devices in place and operating properly. The spreader must be in alignment with the blade and the anti-kickback device must be in place and operating properly. Their action must be checked before cutting.
- Only seasoned, dry, flat wood should be cut.
- Check that the stock has no nails, knots, screws, stones etc. in it prior to cutting into the wood. These items can become projectiles and cause injury.
- Do not use the fence and a mitre gauge at the same time.
- A table saw must be guarded with a hood (crown guard) that completely covers the blade projecting above the table. The guard should ride the thickness of the stock being cut, adjusting to the thickness of the stock.
- The fence must not be adjusted while the saw is running.
- One face and one edge of your material must be flat and straight. They must be oriented to the table surface and fence when cutting to ensure the stability of the stock.
- If the wood is slightly cupped keep the concave side down so that the material rides on the two outside ridges to maintain stability.
- Be aware of the properties of the materials you are using. Different species of wood and man made sheet goods do not react the same when being machined. Some woods are less forgiving and have greater tendency to bind together or peel apart as they are cut.
- The same can be true for some sheet goods like plywood.
- Hands and fingers must be kept clear of the path in which the blade travels.
- Extra care should be taken with small pieces. Hands should always be a minimum of 6" (15cm) away from blade.
- Do not reach into the cutting area until the blade comes to a full stop.
- Read and understand the operator's manual for complete instructions on specialized cuts.

# TABLE SAW (Continued)

## Operating Procedures

### Operating Procedures for Rip Cuts

- Adjust the blade guard on the machine. It should prevent fingers and hands from coming into contact with the blade.
- Never attempt to make a freehand cut.
- The rip fence should be used to rip pieces along the length of the material.
- Do not use the fence to make crosscuts.
- Only rip boards that are at least 12" long.
- The operator should position himself slightly to the left of the machine.
- Maintain a stable balanced stance.
- Support and feed the stock with the right hand while the left hand guides the stock against the fence.
- Both hands are used to ensure that the material always remains flat on the table and tight to the fence. The material must not be allowed to lift from table or veer off of the fence.
- As the material is fed towards the blade the left hand applies light pressure to keep the wood against the fence. The hand should remain stationary allowing the stock to slip underneath it and advance forward without dragging the hand and fingers into the path of the blade.
- The right hand supports and feeds the material at a moderate rate that enables the blade to freely cut without bogging down. Do not place any part of your hand directly in line with the blade as you feed the stock.
- Keep all parts of your hand well away from the blade, 6" – 8" (150mm) and outside any guards.
- A push stick must be used to feed the material whenever the rip fence is set below 6" (150mm) and whenever lengths below 18" (45 cm) are being cut.
- As the cut nears completion the left hand is removed from the stock so that it never advances beyond the front of the guard.
- The right hand must continue to push the stock through until it clears the outfeed or back end of the blade (material must continually be moved forward slowly).
- Work should be released only when it has gone past the blade.
- Whenever the stock is lifted or tilted above the surface of the table, the saw can shake the stock, causing you to lose your grip. Losing your grip on a piece means that your hand can slip toward the saw blade or the work can be forcefully kicked back towards you.
- Do not reach behind or over the blade unless it has stopped turning.
- Turn the machine off ensuring that the blade has stopped moving and that the guard has returned to its safety position and is completely covering the blade.
- Remove any waste and leave workspace clean for the next use.

# TABLE SAW (Continued)

## Operating Procedures for Crosscutting

- Use an appropriate mitre gauge.
- Never attempt to make a freehand cut.
- Do not use the rip fence to make crosscuts unless a spacer block is attached.
- Check that the gauge slides freely in table groove but without any lateral movement. Ensure that material will not be obstructed in any way.
- Slide the rip fence out of the way so that any off-cuts will not be trapped between the rip fence and the blade. If you are trying to use the rip fence to gauge multiple cuts of the same length you must use a spacer block attached to the rip fence near its front.
- Lock the mitre gauge to the selected cutting angle.
- Position material to be cut tight against the table and mitre gauge.
- Position hands to hold the material tight to the table and mitre gauge while advancing forward.
- Do not position hands directly in line with the cutting path.
- Push the gauge and material through until the cut is complete.
- Do not reach behind or over the blade unless it has stopped turning.
- Turn the machine off ensuring that the blade has stopped moving and that the guard has returned to its safety position and is completely covering the blade.
- Remove any waste and leave workspace clean for the next use.

## **Specific Hazards**

- Always wear eye and face protection
- Gloves, loose clothing, jewellery, or any dangling objects including long hair should not be worn as they may catch in the rotating parts of the saw.
- Avoid potential contact with the turning blade. Ensure that all guards are in place and working. If a guard seems slow to return to its normal position, adjust or repair it immediately.
- Use only recommended size and RPM rated blades.
- For rip cuts, use a spreader to prevent material from squeezing the saw or kicking back during ripping.
- Use anti-kickback fingers to hold the stock down in the event that the saw kicks back the material. Maintain and sharpen blade
- Use the proper blade for the cutting action. For example, do not use a crosscut blade for ripping.
- Operate the saw at the speed specified by the manufacturer.
- Leave sufficient clearance for stock.
- Stand to the side of the saw blade to avoid injury due to kickback.
- Guide the wood to be cut parallel to the rip fence to minimize the potential for kickback.
- Avoid crosscutting long boards on table saws.
- Use a filler piece between the fence and the saw blade when necessary especially if there is little clearance on the fence side.
- Properly support all pieces of stock, including the cut and uncut ends, scrap, and finished product. The cutting action of the blade may throw wood chips, splinters, and broken saw teeth

## TABLE SAW (Continued)

- Remove cracked saw blades from service.
- Use a push stick for small pieces of wood and for pushing stock past the blade.
- Keep hands out of the line of the cut.
- Always guard the portion of the blade below the table. Protect operators from possible contact when reaching under the table.
- Always guard the power transmission apparatus (belts, pulleys, chains, sprockets, etc.).
- Kickbacks can occur for the following reasons:
  - the material is not held securely
  - the blade catches the stock and throws it back toward the operator.
  - the material wanders away from the mitre head
  - the material lifts off of the table
  - there is no splitter in place to maintain the saw kerf distance between the stock and off cut
  - the blade and the rip fence are not parallel
  - the blade height is not correct or if the blade is not maintained properly

Additional reference material can be found on pages 57-60 in the Construction Technology section.

# HANDLING CEMENT

*Cement is an odourless grey to white powder that acts as a binding agent when water is added. It includes calcium silicates, aluminates and sulfates. It also contains small amounts of lime and chlorides and trace amounts of some heavy metals.*

*The lime, calcium silicates and alkalis will create a potentially hazardous alkaline solution when mixed with water. This solution can cause alkalis burns when it is in direct contact with the skin. Appropriate clothing is required when working with any construction product that contains cement.*

## **Personal Protection Equipment (PPE) Requirements**

- Safety glasses
- Long pants
- Dust Mask
- C.S.A. Approved safety footwear
- Hand protection

## **First Aid**

### Eye Contact

- Eyes are particularly vulnerable to damage which will increase over the time of exposure
- Do not rub eyes, remove any contact lenses
- Wash eyes out for at least 15 minutes and seek medical attention

### Skin Contact

- Wash the affected area of skin thoroughly with soap and water
- If irritation or pain result then seek medical attention
- Any clothes with wet cement should be removed and washed clean

### Ingestion

- Do not induce vomiting
- Wash out mouth and give patient plenty of water to drink
- Seek medical attention

### Inhalation

- Move patient to fresh air
- If airways become inflamed seek medical attention

If cement is spilled, clean it in a dry state trying not to make the dust airborne.

Store cement in a cool dry place up off of the ground. The contents of any opened bags should be stored in a sealable container. Take care not to rip bags when moving them.

# POISON IVY

*Poison ivy (Toxicodendron radicans) is a plant native to southern Ontario that causes a persistent itchy rash when you come into contact with it.*

Poison ivy can grow in a variety of ways.

- As a shrub (4 feet tall)
- As a trailing vine (4-10 inches off the ground)
- As a climbing vine growing up trees

It can be identified by its three leaflets, alternate leaf arrangement and lack of thorns which have inspired many rhymes meant to warn people from touching it. The middle leaflet of the three sticks out slightly further than the other two.

Poison ivy has a light green leaf which can sometimes look shiny on top. The older leaflets or leaves in the shade tend to be darker green. The plant also develops yellowish to whitish-green flowers in late spring to early summer which develop into clusters of white berries.

The sap of the plant causes the skin irritation. Damage to plant, whether the leaves, stem, or root will cause the sap to weep out and affect any unprotected skin. The sap can also be transferred from any other surface that it has come into contact with such as garden tools, pet's fur, clothing, and so on. The oils can continue to be effective for a long time so it's important to clean anything that has come into contact with the plant. Some people do not react to poison ivy but repeated exposure can intensify the results.

An itchy skin irritation develops sometimes immediately but can take up to two days. The skin will start to form a rash and blisters may weep. The weeping fluids do not spread the irritation. The rash can last up to four weeks.

Calamine lotion and oatmeal baths can soothe the itching.



# HEAT EXHAUSTION

*When humans are exposed to abnormally high environmental temperatures without thermoregulation, they are susceptible to various heat illnesses.*

*Heat exhaustion is a common form of heat illness. The symptoms include heavy sweating, rapid breathing and a fast, weak pulse. If heat exhaustion continues, and a person's body temperature exceeds 40.6 degrees Celsius, they are said to have heat stroke. Symptoms include dry skin, rapid, strong pulse and dizziness. In extreme cases, heat stroke can lead to fainting.*

*Other heat illnesses include [heat cramps](#) (muscle pains or spasms that happen during heavy exercise in hot weather) and heat [rash](#) (skin irritation from excessive sweating).*



# SUN PROTECTION

Ultraviolet radiation (UV rays) is the leading contributor to skin cancer. It is important when working outside for extended periods of time to protect your skin and eyes with UV protective sun screen and UV reflective sun glasses, respectively.

Shade, clothing and hats provide the best protection – applying sunscreen becomes necessary on those parts of the body that remain exposed like the face and hands. Sunscreen should never be used to prolong the duration of sun exposure.

UV PROTECTION CHART				
Low (0-2)	Medium (3-5)	High (6-7)	Very High (7-10)	Extremely High (11+)
Sunscreen	Sunscreen	Sunscreen	Sunscreen	Sunscreen
Sunglasses	Sunglasses	Sunglasses	Sunglasses	Sunglasses
	Hat	Hat	Hat	Hat
		Shade	Shade	Shade
				Staying indoors between 10am-4pm

- Limit time in the midday sun  
The sun's UV rays are the strongest between 10 a.m. and 4 p.m. To the extent possible, limit exposure to the sun during these hours.
- Watch for the UV index  
This important resource helps you plan your outdoor activities in ways that prevent overexposure to the sun's rays. While you should always take precautions against overexposure, take special care to adopt sun safety practices when the UV Index predicts exposure levels of moderate or above.
- Use shade wisely  
Seek shade when UV rays are the most intense, but keep in mind that shade structures such as trees, umbrellas or canopies do not offer complete sun protection. Remember the shadow rule: "Watch your shadow – Short shadow, seek shade!"
- Wear protective clothing  
A hat with a wide brim offers good sun protection for your eyes, ears, face, and the back or your neck. Sunglasses that provide 99 to 100 percent UV-A and UV-B protection will greatly reduce eye damage from sun exposure. Tightly woven, loose fitting clothes will provide additional protection from the sun.
- Use sunscreen  
Apply a broad-spectrum sunscreen of SPF 30+ liberally and re-apply every two hours, or after working outdoors.



# COLD WEATHER SAFETY

*Very cold temperatures, like very hot ones, can be hazardous to your health. Proper dress and some sensible practices can prevent a lot of the problems associated with cold weather. In addition knowing the symptoms of danger and how to treat them can keep problems that do occur from becoming disasters.*



## General Hazards

- The most common hazard in the cold is frostbite. Your body doesn't get enough heat and the body tissues freeze. Body parts most often affected by frostbite are the nose, ears, cheeks, fingers, and toes.
- In very bad cases, frostbite can cause permanent tissue damage and loss of movement in the affected body parts. In the worst cases, you could become unconscious and stop breathing. You could even die of heart failure.
- The other cold hazard is hypothermia - the state when you are exposed to cold so long that your body temperature gets dangerously low. Just like frostbite, the worst case results are unconsciousness and death.
- With both cold hazards, you're more at risk if you're older, overweight, or have allergies or poor circulation. Other factors that raise the risk are smoking, drinking, and taking medications such as sedatives. Individuals with cardiovascular disease, diabetes and hypertension have increased risk in cold weather.
- Cold related illnesses can slowly overcome an individual who has been chilled by cold temperature, strong winds or wet clothing. You need to recognize the environmental and workplace conditions that can lead to cold-induced injuries and illnesses.

## Ways to Protect Workers

- Proper clothing for cold, wet and windy conditions must be on hand. Hats and gloves in addition to proper outer wear is needed.
- Frequent short breaks in warm dry shelters will allow the body to warm up.
- Work during the warmest part of the day.
- Avoid exhaustion or fatigue because a significant amount of energy is needed to keep your body warm.
- Drink warm, sweet drinks, not caffeine.
- Eat warm, high calorie foods.

# COLD WEATHER SAFETY (Continued)

## Identifying Hazards

- It is very important to know the symptoms of frostbite and hypothermia so that you can do something before it is too late.
- Frostbite can occur from being in a cold area or from touching an object whose temperature is below freezing. In many cases, people don't have any idea that it's happening. That's why you have to be familiar with the symptoms.
- Frostbite victims usually start by feeling uncomfortably cold, then numb. Sometimes they also get a tingling or aching feeling or a brief pain. The recommended practice is whenever you feel numbness, take action.
- Hypothermia can also take you by surprise because you can get it even when the temperature is above freezing. Windy conditions, physical exhaustion, and wet clothing can all make you prone to hypothermia.
- With hypothermia, you first feel cold, then pain in the extremities. Your body will shiver, as it tries to raise the temperature.
- Other symptoms include numbness, stiffness (especially in the neck, arms, and legs), poor coordination, drowsiness, slow or irregular breathing and heart rate, slurred speech, cool skin, and puffiness in the face.
- Many of these symptoms are not unusual and could mean different things. If you are exposed to very cold conditions, take them seriously and take steps to relieve them.

## Protection Against Hazards

The best way to deal with cold problems is to prevent them in the first place. The most sensible approach is to limit exposure to cold, especially if it's windy or damp.

If you know you're going to be in cold conditions, don't bathe, smoke, or drink, alcohol just before going out.

- Dress for conditions in layers of loose, dry clothes. The most effective mix is cotton or wool underneath, with something waterproof on top.
- Get dried or changed immediately if your clothes do get wet.
- Be sure to cover hands, feet, face, and head. A hat is critical because you can lose up to 40 percent of your body heat if your head isn't covered.
- Keep moving when you're in the cold.
- Take regular breaks in a warm area. Go where it's warm any time you start to feel very cold or numb. Drink something warm, avoid alcohol or caffeine.

# COLD WEATHER SAFETY (Continued)

## Safety Precautions

- Prevention doesn't always work. It is important to know what to do if you or someone shows symptoms of cold problems.
- The first thing to do is move to a warm area. Remove any frozen, wet, or tight clothing. Dress in warm clothes or blankets. Drink warm, decaffeinated, and non-alcoholic beverages.
- Hypothermia:
  - Call 911 for medical help and keep the person covered with blankets or something similar.
  - Don't use hot baths, electric blankets, or hot water bottles.
  - Give artificial respiration if necessary and try to keep the person awake and dry.
- Frostbite:
  - Don't rub the body part, or apply a heat lamp or hot water bottle.
  - Don't go near a hot stove or heater.
  - Don't break any blisters.
  - Don't drink caffeine.
  - Warm the frozen body part quickly with sheets and blankets or warm (not hot) water.
  - Once the body part is warm, exercise it-with one exception: Don't walk on frostbitten feet.
  - It's dangerous to underestimate the health hazards you're exposed to in the cold. But if you take some precautions before you're exposed and know what symptoms can spell trouble, you substantially reduce your risk.

